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09/826,503	04/05/2001	Charles H. Carter JR.	CM03024J	7883

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EXAMINER	
GRAHAM, ANDREW R	

ART UNIT	PAPER NUMBER
2644	2

DATE MAILED: 12/19/2003

Frank M. Scutch, III
Motorola, Inc.
Law Department
8000 West Sunrise Boulevard
Fort Lauderdale, FL 33322

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/826,503	Applicant(s) CARTER, CHARLES H.	
	Examiner Andrew Graham	Art Unit 2644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *05 April 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Objections

Claims 5 and 6 objected to because of the following informalities:

Line 20, page 9 of currently submitted specification, please correct "on digital signal processor" to read "one digital signal processor"

Claim 6 is objected to based on its dependency upon Claim 5.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 5-8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 5 recites the limitation "the digital signal processor" in line 18 of page 9. There is insufficient antecedent basis for this limitation in the claim.

Claim 5 recites the limitation "the at least one digital signal processor" in lines 19 and 20 of page 9. However, two "at least one digital signal processors" have been referred to at that point in the

claims, one in line 5 and one in line 15, rendering unclear to which 'at least one digital signal processor' this reference is referring. This rejection also applies to the reference to a "the at least one digital signal processor" in line 31 on page 9 in **Claim 6.**

Claim 5 recites the limitation "the electronic device" in line 24 of page 9. There is insufficient antecedent basis for this limitation in the claim.

Claim 7 recites the limitation "the pseudo random noise" in lines 11 and 13 in the claim on page 10. The applicant is requested to change these references to read "the acoustic pseudo random noise" in order to establish consistent references to the "source of acoustic pseudo random noise" first referred to in the claim in line 6 of page 10.

Claim 7 recites the limitation "the at least one digital signal processor" in line 16 and lines 17-18 of page 10. However, two "at least one digital signal processors" have been referred to at that point in the claims, one in line 7 and one in line 13-14, rendering unclear to which 'at least one digital signal processor' these references are referring.

Claim 8 recites the limitation "the pseudo random noise" in lines 11 and 13 in the claim on page 11. The applicant is requested to change these references to read "the acoustic pseudo random noise" in order to establish consistent references to the "source of acoustic pseudo random noise" first referred to in the claim in line 6 of page 11.

Claim 8 recites the limitation "the external speaker" in line 12 of page 11. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yeap (USPN 4118601) in view of Wong et al (USPN 5881103) and Eatwell et al (USPN 5481615). Hereafter, "Wong et al" and "Eatwell et al" will simply be referred to as "Wong" and "Eatwell", respectively.

Yeap discloses a basic method and system for equalizing an audio transducer system. The basic system, shown in Figure 1, involves a testing phase for the output transducer of the system, with the

switches (S1,S2,S3) in the position shown, wherein the signal from the noise generator (28) bypasses the equalizer (10) and is output by the speakers (12) of the system (col. 3, lines 61-66). The emitted signal is received by the microphone (30) connected to the system, which then applies the signal through an amplifier (22) to the equalizer (10) (col. 3, lines 66-68 and col. 4, lines 1-4). This input signal to the equalizer enables the frequency bands of the signals to be variably adjusted to establish a desired characteristic (col. 4, lines 4-20). After the desired frequency responses are established, the original sound generator (26) is reconnected through switching to input a sound signal into the equalizer (10), which then emits the processed signal through the speaker (12) of the system. The noise source (28) is characterized by Yeap as emitting either white or pink noise (col. 2, lines 66-68). The signal generated by the noise generator (28) reads on "providing a source of pseudo random noise" and the manner in which the noise signal is emitted and received reads on "directing the pseudo random noise to an input of a microphone". The resulting response and frequency characteristic adjustments of the equalizer (10) read on "adjusting first coefficients in at least one digital signal processor connected to the microphone". After the adjustments have been made, the switching of the input source of the generator to the audio source (26) reads on "discontinuing the source of pseudo random acoustical noise" and "returning the portable communications device to an operational mode".

While Yeap discloses a basic, pseudo random noise based calibration system for an audio processing device, Yeap does not specify:

- that the speaker the emits the test noise signal is an external speaker of a portable communications device
- that the microphone that receives the test noise signal is a microphone of a portable communications device
- that the coefficients adjusted are those that effect the processing of the microphone
- that the calibration process is applied to multiple speakers

Wong discloses a method and system for adjusting the signal processing of a portable communications devices which is connected to a plurality of auxiliary input and output signal devices. Wong discloses the use of a programmable filter (208) and individual coefficients (416) associated with an auxiliary device for adjusting the characteristics of signals emitted or received through the auxiliary or accessory device (col. 3, lines 46-58). The equalization is performed for signals of the auxiliary devices that are received and emitted via the other parts of the radio communication device (110), which inherently includes the standard input and output transducers as well as the transceiver radio system (col. 3, lines 55-61). The method of establishing the equalizing parameters is illustrated in Figure 5, and similar to Yeap, involves the application of a sample signal across the accessory and comparing the actual response with the reference audio response (col. 4, lines 24-39). The

context of equalizing the input and output transducers of a radio read on "A method for acoustic transducer calibration in a portable communications device". The obvious approaches for 'applying' a sample signal across an accessory component, taken particularly in view of the teachings of Yeap, read on "providing a source of pseudo random acoustical noise to an characterized external speaker source separate from the portable communications device" with the obvious obtaining of the actual signal emitted by a speaker reading on "a microphone used with the portable communications device". The relevant adjusting of the coefficients associated with the microphone reads on "adjusting first coefficients in at least one digital signal processor connected to the microphone for a desired microphone frequency response".

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to implement the calibration system of Yeap into the portable communications scheme of Wong. Wong suggests a similar calibration scheme, however, does not disclose the details. Implementing the calibration system of Yeap would have been motivated by the well-defined and repeatable testing signal of such a system. The benefits of including such a system in the arrangement of Wong would have been the multiple locations and manners in which the desired changes would have been stored, as well as the ability to adapt and process the signals from a plurality of communications interface devices.

While the processing of Wong would have naturally involved all forms of inputs and outputs of the portable communications system, the system of Yeap in view of Wong does not explicitly specify:

- that one of the output speakers for applying the test noise signal is the internal speaker of the communications device

Eatwell discloses a system for maintaining the desired sound at the ear of a listener, wherein the involved actuator is that of a hand held communications device (col. 3, lines 31-41). A specific signal is passed through the actuator (7) of the device and then picked up by a signal sensor (8), as is generally shown in Figure 3. This signal emitted by the sensor (8) is then compared with a delayed version of the originally emitted signal to establish the signal upon which the equalizer of the system is to be adjusted (col. 4, lines 3-14). Figure 7 illustrates an embodiment of a structure that is disclosed by Eatwell as being particularly useful in a telephone (col. 7, lines 7-20). In view of the previously cited teachings of Yeap and Wong, the incorporation of such a system with the hand held communications device speaker reads on "applying the source of pseudo random acoustical noise to an internal speaker source in the portable communications device". The inherent amplitude required by the sensor to obtain a useful sensor signal (9) from the standard telephone actuator (7), particularly in view of the teachings and amplifier of Yeap, reads on "increasing the amplitude of the pseudo random acoustical noise such that it can be detected by the microphone". The resulting changes made to the equalization filter (2) with the

adjustment (5) and desired signals (1), in view of the individual coefficient scheme for each device in the system of Wong, reads on "adjusting the second coefficients in the at least one digital signal processor for a desired internal speaker frequency response".

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to incorporate the calibration of an internal telephone speaker as taught by Eatwell into the combined system of Yeap in view of Wong. Wong teaches the equalization of multiple input and output devices for a portable communications device, and Eatwell clearly discloses the use of the built-in communications interface of a telephone hand set as being one of these input/output devices, thus explicitly extending the range of application of the teachings of Wong as well as Yeap. Particular motivation for combining the teachings of Eatwell would have been the various possible signal processing schemes illustrated in the different embodiments of the invention of Eatwell. The reference of Eatwell is relied upon herein to clearly demonstrate the desire and previously known teachings involved with the equalization of an internal speaker of a telecommunications device.

Regarding **Claim 2**, Wong illustrates the use of a filter (454) for compensating the signals emitted by the external speaker (451) (col. 3, lines 62-66 and Figure 4). Eatwell also discloses the use of filters for compensating for the characteristics of a component used in obtaining an emitted version of a signal (col. 4, lines 3-13). These two teachings read on "utilizing a filter between the source of

pseudo random acoustical noise and the external speaker to compensate for irregularities in the frequency response of the external speaker".

Regarding **Claim 3**, Wong discloses the comparison of a resulting applied signal to the desired response of a reference version of the same signal (col. 4, lines 30-39). Eatwell discusses the formation of a misadjustment signal (5), which corresponds to the difference between the original signal (4) and the obtained sensor signal (9) (col. 4, lines 3-7). The resulting signals of these two teachings read on "comparing the output of the at least one digital signal processor with an optimal acoustic signal from the output of the pseudo random acoustic noise to provide an error signal for adjusting the coefficients of the at least one digital signal processor".

Regarding **Claim 4**, Wong discloses that a sample signal is applied to an accessory device, and that the digital signal processor includes the capability of driving the analog voice signal lines for an accessory (col. 3, lines 15-19 and col. 4, lines 33-39). The DSP also includes a memory (207) for storing information related to the signal processing performed by the filter (208) part of the processor (col. 3, lines 11-19). The obvious generation of the sample signal from the digital signal processor, based on its signal processing and device driving capabilities reads on "the source of pseudo random noise is from the at least one digital signal processor". It is also noted that the ability and incorporation of a digital signal processor for establishing a pseudo random noise signal for transducer calibration is well-known in the art; the reference of Harris (USPN 5339362),

column 11, lines 59-62, has been included with this office action to provide support for such a position.

Regarding **Claim 5**, please refer to the like teachings of Claims 1-4, noting the obvious, if not inherent, use of the digital signal processor of Wong for performing the comparison and component characterization cited therein.

Regarding **Claim 6**, Eatwell discloses the use of a delay element (4) in the signal processing path between the signal source and the formation of the misadjustment signal (col. 4, lines 3-7 and 30-34). This reads on "delaying the source of pseudo random noise compared with the output of the at least digital signal processor for synchronizing the source of pseudo random noise with the output of the at least one digital signal processor".

Regarding **Claim 7**, please refer to the like teachings of Claims 1, 3, and 4, noting particularly adjustment of microphone coefficients taught by Wong, and the involvement of an internal microphone of Eatwell.

Regarding **Claim 8**, please refer to the like teachings of Claims 1, 3, and 4, noting particularly adjustment of loudspeaker coefficients taught by Wong, and the involvement of an internal speaker of Eatwell.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew Graham whose telephone number is (703) 308-6729. The examiner can normally be reached on Monday-Friday (7:30-4:30), excluding alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bill Isen, can be reached at (703) 305-4386. The fax number for the organization where this application or proceeding is assigned is 703-872-9314 for regular communications, and 703-872-9315 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

Andrew Graham
Examiner
A.U. 2644

ag
December 11, 2003

XU MEI
PRIMARY EXAMINER